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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/616,457
Filing Date	07/14/2000
First Named Inventor	Xiao Chen ET AL.
Art Unit	2125
Examiner Name	Sheela S. Rao
Total Number of Pages in This Submission: 38	Attorney Docket Number: 99-464

ENCLOSURES (Check all that apply)

- [X] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [X] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Documents
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance communication to Technology Center (TC)
- [ ] Appeal Communication to Board of Appeals and Interferences
- [X] Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosures(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Andrew J. Ririe, Registration No. 45,597
Signature	
Date	January 6, 2006

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on this date:

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Typed or printed name	Andrew J. Ririe		
Signature		Date	1-6-2006

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FEE TRANSMITTAL for FY 2003

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500

Complete if Known	
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Filing Date	07/14/2000
First Named Inventor	Xiao Chen ET AL.
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Art Unit	2125
Attorney Docket No.	99-464

METHOD OF PAYMENT *(check all that apply)*

☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account

Deposit Account Number: 03-1129

Deposit Account Name:

The Director is authorized to: *(check all that apply)*

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☐ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	790	2001	385	Utility filing fee	
1002	350	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	790	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X		=	
Independent Claims		- 3** =		X		=	
Multiple Dependent						=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2002	9	Claims in excess of 20
1201	88	2001	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	88	2204	43	**Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	210	Extension for reply within second month	
1253	980	2253	475	Extension for reply within third month	
1254	1,530	2254	740	Extension for reply within fourth month	
1255	2,080	2255	1,005	Extension for reply within fifth month	
1401	340	2401	185	Notice of Appeal	
1402	340	2402	165	Filing a brief in support of an appeal	500
1403	300	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,370	2453	665	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	240	Design issue fee	
1503	660	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 500

SUBMITTED BY

(Complete *(if applicable)*)

Name (Print/Type)	Andrew J. Ririe	Registration No. (Attorney/Agent)	45,597	Telephone	(309) 636-1974
Signature				Date	01/06/2006

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 37 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
XIAO CHEN et al.	)	Art Unit: 2125
Application No.: 09/616,457	)	Examiner: SHEELA S. RAO
Filed: July 14, 2000	)	
For: METHOD FOR PROVIDING A PROCESS MODEL FOR A MATERIAL IN A MANUFACTURING PROCESS	)	
Attorney Docket No.: 99-464	)	

Peoria, Illinois
January 6, 2006

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

A final Office action was issued on January 14, 2005 ("the Office action"). In response thereto, and in accordance with 37 C.F.R. § 1.191, applicants filed a Notice of Appeal After Final Rejection which was received in the mail room of the U.S. Patent and Trademark Office on June 9, 2005. Following the filing of a Notice of Appeal After Final Rejection, 37 C.F.R. § 1.192(a) requires that an Appeal Brief be filed within two months of the Notice being received by the U.S. Patent and Trademark Office. The two month time period set by 37 C.F.R. § 1.192(a) for filing this Brief is extended by five months until January 9, 2005, by a simultaneously submitted Petition for Extension of Time Under 37 C.F.R. § 1.136(a). The fee

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for the extension of time should be withdrawn from the undersigned's deposit account no. 03-1129.

1. REAL PARTY IN INTEREST

The real party in interest in this appeal is Caterpillar Inc., the assignee of the present patent application. The assignment document assigning all interest in this patent application to Caterpillar Inc. has been duly recorded at the U.S. Patent and Trademark Office.

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals nor interferences.

3. STATUS OF CLAIMS

Claims 1-16 are pending in the application. Each of claims 1-16 was finally rejected in the Office action of January 14, 2005, for allegedly being obvious under 35 U.S.C. § 103(a).

4. STATUS OF AMENDMENTS

There are no pending amendments that have not been entered.

5. SUMMARY OF INVENTION

The invention claimed in this patent application involves the modeling or simulation of a manufacturing process to predict the stresses and distortions induced by the

process. *See* specification, page 5, lines 9-27. It is known to model or simulate certain manufacturing processes, such as welding and thermal cutting, to predict the residual stresses and distortions in the material that the process will cause. *See* specification, page 2, lines 2-6. Modeling or simulation is known as a method for predicting these stresses and distortions, without measuring them directly. One known use for predicting the residual stresses and distortions that will be produced by a manufacturing process is verifying that the process will result in the production of a part where the residual stresses and distortions are within acceptable limits. If the residual stresses and distortions that are predicted by the model or simulation are not within acceptable limits, the process parameters can be modified in an attempt to bring those stresses and distortions within the acceptable limits.

It is proposed in the present disclosure that the accuracy of these models or simulations can be improved. The improvement in accuracy may be obtained by factoring into the model or simulation of a current manufacturing process, the residual stresses and distortions that result from a prior manufacturing process. *See* specification, page 7, lines 29-34, page 8, lines 1-7. The stresses and strains from the current manufacturing process may then be predicted as a function of the current manufacturing process parameters, and the residual stresses and strains in the material from prior processes. *See* specification, page 8, lines 8-34, page 9, lines 1-10. *See also* FIG. 2. The stresses and distortions calculated from the model or simulation of the current manufacturing process may then be provided to models or simulations of subsequent, downstream manufacturing operations. *See* specification, page 9, lines 11-20. *See also* FIG. 2.

6. ISSUES

The single issue presented by this appeal is whether claims 1-16 are unpatentable for allegedly being obvious under 35 U.S.C. § 103(a) in view of U.S. Patent No. 6,061,640 to Tanaka ("the Tanaka patent").

7. GROUPING OF CLAIMS

Only for the purpose of resolving the issue for appeal presented herein, applicants declare that claims 1-16 will stand or fall together.

8. ARGUMENT

Claims 1-16 stand rejected under 35 U.S.C. § 103(a) for allegedly being obvious in view of the Tanaka patent. This rejection is incorrect because the Tanaka patent does not establish a *prima facie* case that the inventions of these claims are obvious.

Claims 1, 8, and 13 are the independent claims. Each of claims 1, 8, and 13 recites receiving stress and distortion information for a material from a previous manufacturing process, and determining updated stress and distortion information from a process model where the updated stress and distortion information is a function of the stress and distortion information from the previous process and a present process.

The Tanaka patent is directed to using multivariate regression analyses to determine which factors in a manufacturing process contribute to product defects. The Tanaka

patent does not discuss stress and distortion information, nor using a model or simulation to predict stress and distortion information. In fact, a word search of the text of the Tanaka patent reveals that the words "stress" and "distortion" do not appear anywhere in the text. The Tanaka patent further does not discuss receiving stress and distortion information for a material from a previous manufacturing process, and determining updated stress and distortion information from a process model where the updated stress and distortion information is a function of the information from the previous process and a present process.

The Office Action states that "[a]t col. 3: ll.37, et seq., the prior art of reference discusses the process used for collecting and processing the adverse factor data (information regarding stresses and distortions)." *See* Office action, page 3. Nowhere in the Tanaka reference is adverse factor data described as relating to stresses and distortions. The Tanaka patent discusses a diffusion process for the manufacture of semiconductors, so it is not surprising that stresses and distortions of materials are not mentioned. Thus, it appears that the statement in the Office action, page 3, that the Tanaka reference teaches about stresses and distortions is clearly incorrect.

The Office action further states that "Tanaka teaches that the data to be analyzed is input as parameters into an input unit which is then used by the search unit for analysis. Furthermore, the disclosure by Tanaka states that the analysis is made at several stages so as to define the variables at each stage of analysis." *See* Office action, pages 3-4. This statement from the Office action does not explain how Tanaka teaches or renders obvious the concept of

receiving stress and distortion information for a material from a previous manufacturing process, and determining updated stress and distortion information from a process model where the updated stress and distortion information is a function of the information from the previous process and a present process. The stages of analysis discussed in Tanaka refer to stages of analyzing sets of explanation variables, with each stage analyzing the set of explanation variables in a different way so as to finally narrow down to the most important explanation variable which may be causing manufacturing defects. The stages discussed in the Tanaka patent do not at all refer to stages of manufacturing operations, and therefore Tanaka clearly does not disclose or teach stress and distortion data from one stage of a manufacturing operation being fed to a model or simulation of a next stage of a manufacturing process.

Therefore, for all of the proceeding reasons, the Office action has failed to set forth a *prima facie* case of obviousness. The rejection of claims 1-16 under 35 U.S.C. § 103(a) is incorrect and should be withdrawn.

9. APPENDIX

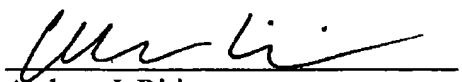
An appendix containing a copy of the claims involved in this appeal is attached hereto.

10. CONCLUSION

Any fees required by this Appeal Brief, the accompanying Petition, or as a result of any other requirement at any time during the pendency of this patent application may be withdrawn from the undersigned's deposit account no. 03-1129.

The examiner is encouraged to telephone the undersigned representative for a quick resolution of any outstanding issues to place this application in condition for allowance.

Respectfully submitted,



Andrew J. Ririe
Patent Attorney, Caterpillar Inc.
Registration No. 45,597

Telephone: (309) 636-1974
Facsimile: (309) 675-1236

APPENDIX
COPY OF CLAIMS UNDER APPEAL

1. (Original) A method for providing a process model for a material in a manufacturing process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the present manufacturing process, the updated stress and distortion information being a function of the stresses and distortions caused by the present manufacturing process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

2. (Original) A method, as set forth in claim 1, wherein the process model is a thermal process model.

3. (Original) A method, as set forth in claim 2, wherein the stresses and distortions are thermal stresses and distortions.

4. (Original) A method, as set forth in claim 3, wherein the stresses and distortions include changes in dimensions of the material.

5. (Original) A method, as set forth in claim 3, wherein the stresses and distortions include changes in properties of the material.

6. (Original) A method, as set forth in claim 3, wherein the material is a metal being processed by thermal processes.

7. (Original) A method, as set forth in claim 6, wherein the thermal process is one of a thermal cutting and welding process.

8. (Original) A method for providing a process model for a material in a thermal cutting process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the thermal cutting process, the updated stress and distortion information being a function of the stresses and distortions caused by the thermal cutting process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

9. (Original) A method, as set forth in claim 8, wherein the material is a metal being cut by the thermal cutting process.

10. (Original) A method, as set forth in claim 9, wherein the previous manufacturing process is one of a steel rolling process and a shot blasting process.

11. (Original) A method, as set forth in claim 9, wherein the subsequent manufacturing process is one of a bending process and a welding process.

12. (Original) A method, as set forth in claim 8, wherein determining the updated stress and distortion information includes the steps of:

receiving residual stress information from the previous manufacturing process;

mapping deformations of the material from the stress and distortion information received from the previous manufacturing process;

modeling the thermal stresses caused by thermal cutting of the material;

incorporating a set of thermal material laws of the material, the thermal material laws defining properties of the material in a transition state from solid to liquid; and

determining a thermal cutting model of the stresses and distortions of the material as a function of the above steps.

13. (Original) A method for providing a process model for a material in a welding process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the welding process, the updated stress and distortion information being a function of the stresses and distortions caused by the welding process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

14. (Original) A method, as set forth in claim 13, wherein the material is a metal being welded by the welding process.

15. (Original) A method, as set forth in claim 14, wherein the previous manufacturing process is one of a thermal cutting process and a bending process.

16. (Original) A method, as set forth in claim 14, wherein the subsequent manufacturing process is a machining process.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
XIAO CHEN et al.	)	Art Unit: 2125
	)	
Application No.: 09/616,457	)	Examiner: SHEELA S. RAO
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Filed: July 14, 2000	)	
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For: METHOD FOR PROVIDING A PROCESS MODEL FOR A MATERIAL IN A MANUFACTURING PROCESS	)	
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Attorney Docket No.: 99-464	)	

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Telephone: (309) 636-1974
Facsimile: (309) 675-1236

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determining a thermal cutting model of the stresses and distortions of the material as a function of the above steps.

13. (Original) A method for providing a process model for a material in a welding process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the welding process, the updated stress and distortion information being a function of the stresses and distortions caused by the welding process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

14. (Original) A method, as set forth in claim 13, wherein the material is a metal being welded by the welding process.

15. (Original) A method, as set forth in claim 14, wherein the previous manufacturing process is one of a thermal cutting process and a bending process.

16. (Original) A method, as set forth in claim 14, wherein the subsequent manufacturing process is a machining process.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
XIAO CHEN et al.	)	Art Unit: 2125
	)	
Application No.: 09/616,457	)	Examiner: SHEELA S. RAO
	)	
Filed: July 14, 2000	)	
	)	
For: METHOD FOR PROVIDING A PROCESS MODEL FOR A MATERIAL IN A MANUFACTURING PROCESS	)	
	)	
Attorney Docket No.: 99-464	)	

Peoria, Illinois
January 6, 2006

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Alexandria, VA 22313-1450

APPEAL BRIEF

A final Office action was issued on January 14, 2005 ("the Office action"). In response thereto, and in accordance with 37 C.F.R. § 1.191, applicants filed a Notice of Appeal After Final Rejection which was received in the mail room of the U.S. Patent and Trademark Office on June 9, 2005. Following the filing of a Notice of Appeal After Final Rejection, 37 C.F.R. § 1.192(a) requires that an Appeal Brief be filed within two months of the Notice being received by the U.S. Patent and Trademark Office. The two month time period set by 37 C.F.R. § 1.192(a) for filing this Brief is extended by five months until January 9, 2005, by a simultaneously submitted Petition for Extension of Time Under 37 C.F.R. § 1.136(a). The fee

for the extension of time should be withdrawn from the undersigned's deposit account no. 03-1129.

1. REAL PARTY IN INTEREST

The real party in interest in this appeal is Caterpillar Inc., the assignee of the present patent application. The assignment document assigning all interest in this patent application to Caterpillar Inc. has been duly recorded at the U.S. Patent and Trademark Office.

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals nor interferences.

3. STATUS OF CLAIMS

Claims 1-16 are pending in the application. Each of claims 1-16 was finally rejected in the Office action of January 14, 2005, for allegedly being obvious under 35 U.S.C. § 103(a).

4. STATUS OF AMENDMENTS

There are no pending amendments that have not been entered.

5. SUMMARY OF INVENTION

The invention claimed in this patent application involves the modeling or simulation of a manufacturing process to predict the stresses and distortions induced by the

process. *See* specification, page 5, lines 9-27. It is known to model or simulate certain manufacturing processes, such as welding and thermal cutting, to predict the residual stresses and distortions in the material that the process will cause. *See* specification, page 2, lines 2-6. Modeling or simulation is known as a method for predicting these stresses and distortions, without measuring them directly. One known use for predicting the residual stresses and distortions that will be produced by a manufacturing process is verifying that the process will result in the production of a part where the residual stresses and distortions are within acceptable limits. If the residual stresses and distortions that are predicted by the model or simulation are not within acceptable limits, the process parameters can be modified in an attempt to bring those stresses and distortions within the acceptable limits.

It is proposed in the present disclosure that the accuracy of these models or simulations can be improved. The improvement in accuracy may be obtained by factoring into the model or simulation of a current manufacturing process, the residual stresses and distortions that result from a prior manufacturing process. *See* specification, page 7, lines 29-34, page 8, lines 1-7. The stresses and strains from the current manufacturing process may then be predicted as a function of the current manufacturing process parameters, and the residual stresses and strains in the material from prior processes. *See* specification, page 8, lines 8-34, page 9, lines 1-10. *See also* FIG. 2. The stresses and distortions calculated from the model or simulation of the current manufacturing process may then be provided to models or simulations of subsequent, downstream manufacturing operations. *See* specification, page 9, lines 11-20. *See also* FIG. 2.

6. ISSUES

The single issue presented by this appeal is whether claims 1-16 are unpatentable for allegedly being obvious under 35 U.S.C. § 103(a) in view of U.S. Patent No. 6,061,640 to Tanaka ("the Tanaka patent").

7. GROUPING OF CLAIMS

Only for the purpose of resolving the issue for appeal presented herein, applicants declare that claims 1-16 will stand or fall together.

8. ARGUMENT

Claims 1-16 stand rejected under 35 U.S.C. § 103(a) for allegedly being obvious in view of the Tanaka patent. This rejection is incorrect because the Tanaka patent does not establish a *prima facie* case that the inventions of these claims are obvious.

Claims 1, 8, and 13 are the independent claims. Each of claims 1, 8, and 13 recites receiving stress and distortion information for a material from a previous manufacturing process, and determining updated stress and distortion information from a process model where the updated stress and distortion information is a function of the stress and distortion information from the previous process and a present process.

The Tanaka patent is directed to using multivariate regression analyses to determine which factors in a manufacturing process contribute to product defects. The Tanaka

patent does not discuss stress and distortion information, nor using a model or simulation to predict stress and distortion information. In fact, a word search of the text of the Tanaka patent reveals that the words "stress" and "distortion" do not appear anywhere in the text. The Tanaka patent further does not discuss receiving stress and distortion information for a material from a previous manufacturing process, and determining updated stress and distortion information from a process model where the updated stress and distortion information is a function of the information from the previous process and a present process.

The Office Action states that "[a]t col. 3: ll.37, et seq., the prior art of reference discusses the process used for collecting and processing the adverse factor data (information regarding stresses and distortions)." *See* Office action, page 3. Nowhere in the Tanaka reference is adverse factor data described as relating to stresses and distortions. The Tanaka patent discusses a diffusion process for the manufacture of semiconductors, so it is not surprising that stresses and distortions of materials are not mentioned. Thus, it appears that the statement in the Office action, page 3, that the Tanaka reference teaches about stresses and distortions is clearly incorrect.

The Office action further states that "Tanaka teaches that the data to be analyzed is input as parameters into an input unit which is then used by the search unit for analysis. Furthermore, the disclosure by Tanaka states that the analysis is made at several stages so as to define the variables at each stage of analysis." *See* Office action, pages 3-4. This statement from the Office action does not explain how Tanaka teaches or renders obvious the concept of

receiving stress and distortion information for a material from a previous manufacturing process, and determining updated stress and distortion information from a process model where the updated stress and distortion information is a function of the information from the previous process and a present process. The stages of analysis discussed in Tanaka refer to stages of analyzing sets of explanation variables, with each stage analyzing the set of explanation variables in a different way so as to finally narrow down to the most important explanation variable which may be causing manufacturing defects. The stages discussed in the Tanaka patent do not at all refer to stages of manufacturing operations, and therefore Tanaka clearly does not disclose or teach stress and distortion data from one stage of a manufacturing operation being fed to a model or simulation of a next stage of a manufacturing process.

Therefore, for all of the proceeding reasons, the Office action has failed to set forth a *prima facie* case of obviousness. The rejection of claims 1-16 under 35 U.S.C. § 103(a) is incorrect and should be withdrawn.

9. APPENDIX

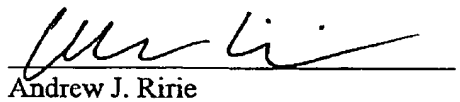
An appendix containing a copy of the claims involved in this appeal is attached hereto.

10. CONCLUSION

Any fees required by this Appeal Brief, the accompanying Petition, or as a result of any other requirement at any time during the pendency of this patent application may be withdrawn from the undersigned's deposit account no. 03-1129.

The examiner is encouraged to telephone the undersigned representative for a quick resolution of any outstanding issues to place this application in condition for allowance.

Respectfully submitted,



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APPENDIX
COPY OF CLAIMS UNDER APPEAL

1. (Original) A method for providing a process model for a material in a manufacturing process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the present manufacturing process, the updated stress and distortion information being a function of the stresses and distortions caused by the present manufacturing process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

2. (Original) A method, as set forth in claim 1, wherein the process model is a thermal process model.

3. (Original) A method, as set forth in claim 2, wherein the stresses and distortions are thermal stresses and distortions.

4. (Original) A method, as set forth in claim 3, wherein the stresses and distortions include changes in dimensions of the material.

5. (Original) A method, as set forth in claim 3, wherein the stresses and distortions include changes in properties of the material.

6. (Original) A method, as set forth in claim 3, wherein the material is a metal being processed by thermal processes.

7. (Original) A method, as set forth in claim 6, wherein the thermal process is one of a thermal cutting and welding process.

8. (Original) A method for providing a process model for a material in a thermal cutting process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the thermal cutting process, the updated stress and distortion information being a function of the stresses and distortions caused by the thermal cutting process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

9. (Original) A method, as set forth in claim 8, wherein the material is a metal being cut by the thermal cutting process.

10. (Original) A method, as set forth in claim 9, wherein the previous manufacturing process is one of a steel rolling process and a shot blasting process.

11. (Original) A method, as set forth in claim 9, wherein the subsequent manufacturing process is one of a bending process and a welding process.

12. (Original) A method, as set forth in claim 8, wherein determining the updated stress and distortion information includes the steps of:

receiving residual stress information from the previous manufacturing process;

mapping deformations of the material from the stress and distortion information received from the previous manufacturing process;

modeling the thermal stresses caused by thermal cutting of the material;

incorporating a set of thermal material laws of the material, the thermal material laws defining properties of the material in a transition state from solid to liquid; and

determining a thermal cutting model of the stresses and distortions of the material as a function of the above steps.

13. (Original) A method for providing a process model for a material in a welding process, including the steps of:

receiving stress and distortion information of the material from a previous manufacturing process;

determining updated stress and distortion information of the material from a process model for the welding process, the updated stress and distortion information being a function of the stresses and distortions caused by the welding process and the stresses and distortions from the previous manufacturing process; and

providing the updated stress and distortion information of the material to a subsequent manufacturing process.

14. (Original) A method, as set forth in claim 13, wherein the material is a metal being welded by the welding process.

15. (Original) A method, as set forth in claim 14, wherein the previous manufacturing process is one of a thermal cutting process and a bending process.

16. (Original) A method, as set forth in claim 14, wherein the subsequent manufacturing process is a machining process.